

# **The Chicago Meeting Series**

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## **An AST Perspective**

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@ Chicago-3

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**TOWARDS A NATIONAL  
NEXT GENERATION RADIO-WAVELENGTH  
ASTRONOMY PROGRAM**

**BUILDING THE FOUNDATION FOR US  
ASTRONOMY AT METER TO  
CENTIMETER WAVELENGTHS  
IN 2010 AND BEYOND**

## Objectives for Defining the Program

- Determine the highest priority science drivers to be addressed at radio wavelengths.
- Define a Program, with facilities (e.g. SKA/RSST), which will meet the science drivers.
  - Need to define the path toward the facilities, from development through construction and into operations, including successful partnership formation
  - May require interaction of NSF with US and international scientific communities and with counterpart funding agency colleagues.
- Need to assure a healthy US scientific enterprise going into the SKA era.
  - Need to define a “System” to achieve the objective.
    - Identify current facilities and instrumentation to be maintained and improved.
    - “Precursor” science
  - Plan a system that is robust against delays and uncertainty along the SKA path.

NOTE: SKA is used as a generic term for the next generation radio-wavelength facility/facilities.

**\*The Objectives are COMMUNITY driven\***

**\*The community must self-organize to define the Program and take it to the Decadal Survey\***

# SKA STATUS WITH NSF

We recognize

- International view that the SKA could be the next generation facility for meter- and centimeter-wavelength astronomy.
- The SKA will be an international facility.
- We share that view, BUT
  - SKA has not been endorsed or prioritized by a US A&A Decadal Survey
  - At this stage, we must view “SKA” as a generic term for a facility. Definition of the detailed properties is a primary objective of the FP-7 SKA Preparatory Study.
- Therefore,
  - NSF cannot officially endorse SKA as a project that we will support financially.
  - We prefer SKA **Program** vice **Project**

## SKA STATUS (cont)

- Since we cannot state that we expect to be a funding partner, there are both legal and policy reasons why we cannot sit on any official boards, councils, or committees that are governing the development of the SKA project.
- While we cannot officially endorse the SKA as a project, we do expect to participate in informal forums for planning and discussing SKA issues.
  - Funding Agencies Working Group
  - SKA Forum
  - PrepSKA (FP-7)

# COMMENTS ON SKA PROGRAM

- Support the baseline concept of 3 components as laid out in discussion paper.
  - SKA-Lo: <0.3 GHz
  - SKA-Mid: 0.3 to ~3 GHz
  - SKA-Hi: ~1 to ~25 GHz
- Might be 3 different arrays; they may not all be at the same location
- State of readiness differs
  - SKA-Mid is in the highest state of readiness in terms of scientific drivers and technology development.
- SKA-Hi might be build out of EVLA, but not ready for construction in the coming decade.
  - Would take advantage of significant infrastructure already in place.
  - Would retain major radio facility in USA in SKA era.
- Recognize the USA SKA Consortium plan to participate in overall SKA program at the 1/3 level.
  - Does not mean 1/3 participation in each component; may be a larger fraction of SKA-Hi and smaller fraction of SKA-Mid and SKA-Lo.
- Hope that all signatories to the new SKA Collaboration Agreement will fully adopt participation in the full SKA Program and work out their levels of participation in each component.
- US may take the lead on SKA-Hi, but international participation is necessary.

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# CHALLENGES

- Challenge to the US community to organize to bring the Next Generation Radio-Wavelength Program together.
- Challenge to the US SKA Consortium to obtain buy-in to the SKA Program by the international partners.
  - Make the case how participation in the full Program can be a win for all partners and for the global astronomical community.
- Two countries are contending for hosting the SKA and their governments have committed significant funding to pathfinders. I challenge the SSEC and SPDO to develop a plan so that both sites are in a win-win situation in the SKA era.

# PATH TO THE 2010 DECADAL SURVEY (concluded from Chicago-2 and Chicago-3)

- SKA-Mid ready for construction start in the decade.
  - Questions
    - Sold in the USA as RSST?
    - Phase 1; Full SKA-Mid; Both?
    - Level of US financial participation?
- SKA-Lo must await first results from Pathfinders – LOFAR, LWA, MWA, PAPER.
  - Submit community White Paper (Position Paper) to the Survey laying out the schedule for facility definition.
  - Depend on need for Survey flexibility to make adjustments during the course of the decade.
- SKA-Hi must await results from EVLA and from ALMA.
  - Submit a costed plan for technology development and system design



# NSF Funding Considerations for a Major Project

- US Astronomy & Astrophysics Decadal Survey
  - High position in the priority list
- The MREFC account is used to support the construction (only!) of all major NSF facilities.
  - Several stage process, post design and development
  - Highly oversubscribed; intense competition from many NSF disciplines
  - For AST projects, threshold for MREFC is ~\$100M
- Formal proposal from the community must demonstrate
  - High priority community support
  - Significant research and education need
  - Readiness for construction start
  - Firm cost estimate (project must be very well defined)
  - Strong project management and execution plan
  - Partnership possibilities thoroughly exploited

# 2010 DECADAL SURVEY

- Expect a start in 2008 and report in 2010 +.
- Discussions within the community and among NSF, NASA, DOE, and NRC on the organization and process for carrying out the Survey.
  - BPA e-mailbox

# Decadal Survey Planning

- How should the Survey Committee and Panels effectively gather input from entire community?
- Should the Survey Panels be organized around scientific area, or around investigative technique?
- Should individuals from outside the field be members of the Survey Committee, and in what role?
- How can the next Survey Committee increase the accuracy of its cost estimates?
- How should the Decadal Survey address uncompleted recommendations from previous decadal surveys?
- How should the Survey Committee coordinate with astronomers and astrophysicists internationally?
- What subfields at the boundaries of astronomy and astrophysics should be included in the Decadal Survey?
- How can the Decadal Survey remain flexible as circumstances change throughout a decade?
- Should the Decadal Survey's recommendations include a prioritization across categories, e.g., space vs. ground, major vs. moderate, etc.?
- How should the Survey incorporate consideration of realistic budgetary outlook?
- How should the Survey incorporate consideration of existing infrastructure; as did the AST Senior Review?